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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,440	01/22/2002	Naomasa Shiraishi	111734	6415
7590		07/29/2004	EXAMINER	
Oliff & Berridge		SONG, MATTHEW J		
PO Box 19928		ART UNIT		
Alexandria, VA 22320		PAPER NUMBER		
		1765		
DATE MAILED: 07/29/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,440

Applicant(s)

SHIRAISHI, NAOMASA

Examiner

Matthew J Song

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/15/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's arguments, see the response, filed 5/11/2004, with respect to the restriction requirement have been fully considered and are persuasive. The restriction requirement of claims 1-25 has been withdrawn.

Allowable Subject Matter

2. The indicated allowability of claims 1-25 is withdrawn in view of the newly discovered reference(s) to Fujita et al (JP 4-188100), Nishinaga et al (JP 11-195585), Suzuki et al (JP 10-242029), and Magome et al (WO 99/25010). Rejections based on the newly cited reference(s) follow.

Claim Objections

3. Claim 10 is objected to because of the following informalities: The amendment and remarks filed on 1/25/2004 are inconsistent. The remarks state "connected to" was amended to "communicated to", however the claims filed on 1/25/2004 still recite "connected to". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1765

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al (JP 4-188100), an English Abstract has been provided.

Fujita et al discloses a gas replacing method for an X-ray exposure device and a tightly enclosed space, which includes an optical path for an exposure light beam (Figure 1). Fujita et al also discloses a valve 20 is opened to decrease the pressure in a closed vessel and when the pressure is decreased to this pressure the valve 20 is closed, this reads on applicant's pressure reducing step. After valve 20 is closed, valve 18 is opened, which allows helium to flow into the closed vessel and when the pressure becomes atmospheric pressure the valve 18 is closed, this reads on applicant's filling step. Fujita et al also discloses this operation is repeated until the helium concentration reaches a determined value. Fujita et al also discloses the depressurized pressure is obtained in advance and is the pressure in which temperature variation during evacuation is within 0.5°C and vacuum electric discharge does not occur in the components in the closed vessel, this is a teaching that the depressurized pressure is a result effective variable (Abstract).

6. Claims 3-4 and 21 are rejected under 35 U.S.C. 102 (b) as being anticipated by Suzuki et al (JP 10-242029), an English Abstract and English Computer Translation (CT) have been provided.

Art Unit: 1765

Suzuki et al discloses an exposure method for illuminating a first object with an exposure light beam 71 and exposing a second object 77 with the exposure light beam having passed through a pattern on the first object 74 (CT [0002]-[0003]). Suzuki et al also discloses a chamber (CT [0013]), this reads on applicant's tightly enclosed space which includes at least a part of an optical path for the exposure light beam. Suzuki et al also discloses supplying the chamber with an oxidizing gas, this reads on applicant's substituting with a first gas, and then purging the oxidizing gas with nitrogen, argon or neon, this reads on applicant's substituting with a second gas (CT [0014]-[0018]). Suzuki et al also discloses using an ArF laser with a wavelength of 193 nm (CT [0006]).

Referring to claim 2, Nitrogen and neon inherently have a better transmittance than oxidizing gases, as evidenced by Hasegawa et al (US 2003/0025889) below.

Referring to claim 21, Suzuki et al discloses a step of transferring a device pattern onto a workpiece (CT [0002]).

7. Claims 3-4 and 21 are rejected under 35 U.S.C. 102 (a) as being anticipated by Nishinaga et al (JP 11-195585), an English Abstract and English Computer Translation (CT) have been provided.

Nishinaga et al discloses an aligner and a method of exposure comprising a hermetically sealed space, this reads on applicant's tightly enclosing a space. Nishinaga et al also discloses a first gas is supplied to the sealing block and then a second gas is supplied to the sealing block (CT [0040]). Nishinaga et al also discloses using an ArF laser (193 nm) and a F₂ laser (157 nm)

Art Unit: 1765

(CT [0039]). Nishinaga et al also discloses a first gas of an inert gas and a second gas comprising oxygen (CT claims 1-7).

8. Claims 5-20 and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Magome et al (WO 99/25010), where US 2002/0145711 is used as an accurate translation.

Magome et al discloses an exposure apparatus ('711 [0056]), note Figure 1, comprising a gas tight chamber 6 which tightly encloses a space including at least a part of an optical path for an exposure light beam ('711 [0054]-[0058]). Magome et al also teaches a gas supply unit which is connected to the gas tight chamber and which supplies a gas through which the exposure light beam is transmitted into the gas tight chamber ('711 [0069]). Magome et al also discloses the gas is passed through a dust collecting and moisture removing apparatus, such as a HEPA filter or an ULPA filter ('711 [0070]), this reads on applicant's impurity removing filter which removes steam. Magome et al also discloses an impurity removal apparatus for removing other impurities ('711 [0071]-[0075]). Magome et al also discloses the impurities removal apparatus is provided downstream of the dust collection and moisture removal system but may be provided upstream of the dust collection and moisture removal system ('711 [0075]). Magome et al also discloses after the gas passes through the impurity removal apparatus, the gas reaches a refrigeration apparatus and a temperature adjustment apparatus 43 ('711 [0076] and [0077]), this reads on applicant's temperature adjusting mechanism.

Referring to claims 8-10 and 17-18, Magome et al discloses impurity concentration meter 89, a nitrogen concentration meter, an oxygen concentration meter and humidity meters, this reads on applicant's gas concentration meters measure oxygen and steam, and a control system

Art Unit: 1765

45 may control the opening and closing of the valves based on these meters ('711 [0096]-[0097]).

Referring to claims 11 and 19, Magome et al discloses a gas tight chamber, a gas supply unit comprising a gas supply pipe, this reads on applicant's filling mechanism, and a pressure controlling mechanism ('711 [0097]). Magome et al is silent to the filling mechanism wills the gas tight chamber with the gas until an intermediate pressure between the first gas pressure and the second gas pressure is obtained and a control unit controls the pressure reducing mechanism and the filling mechanism so that the reduction of the gas pressure and the filling with the gas are repeated a plurality of times. These limitations are viewed as intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The control system 45 taught by Magome et al regulates flow rate and pressure of a gas to control the pressure within a chamber. Therefore, the control system taught by Magome et al would be capable of controlling pressure and flow rates of gases, as claimed by applicant. Furthermore, the intended use is disclosed by Suzuki et al (JP 10-242029) and Nishinaga et al (JP 11-195585) above.

Referring to claims 12 and 20, Magome et al discloses a helium supply unit, this reads on applicant's first gas supply unit and a nitrogen supply unit, this reads on applicant's second gas

Art Unit: 1765

supply unit ('711 [0103]). Magome et al also discloses a control system 45 regulates the flow rate of gas ('711 [0077] and [0097]).

Referring to claim 13, Magome et al does not disclose the adjusting unit drives the first supply gas to supply the first gas and then drives the second gas supply unit to supply the second gas. The Office views these limitations as intended use limitations. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The control system 45 taught by Magome et al regulates flow rate of a gas. Therefore, the control system taught by Magome et al would be capable of controlling flow rates of gases and the supplying order, as claimed by applicant.

Referring to claim 22-25, Magome et al discloses transferring a device pattern onto a workpiece by using the exposure apparatus ('711 [0016]).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1765

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magome et al (WO 99/25010), where US 2002/0145711 is used as an accurate translation, in view of Fujita et al (JP 4-188100), an English Abstract has been provided.

Magome et al teaches an exposure method of employing an ArF excimer laser (192 nm), or X-rays as an exposure energy beam when helium or the like is supplied to a portion of the optical path of the exposure energy beam ('711 [0056]). Magome et al also discloses nitrogen or helium may be supplied ('711 [0099] and [0103]), this reads on applicant's rare gas.

Magome et al does not teach filling a tightly enclosed space with a gas until a gas pressure approximate a first gas pressure is obtained by alternately repeating pressure reducing step and a filling step.

Fujita et al discloses a gas replacing method for an X-ray exposure device and a tightly enclosed space, which includes an optical path for an exposure light beam (Figure 1). Fujita et al also discloses a valve 20 is opened to decrease the pressure in a closed vessel and when the pressure is decreased to this pressure the valve 20 is closed, this reads on applicant's pressure reducing step. After valve 20 is closed, valve 18 is opened, which allows helium to flow into the closed vessel and when the pressure becomes atmospheric pressure the valve 18 is closed, this reads on applicant's filling step. Fujita et al also discloses this operation is repeated until the helium concentration reaches a determined value. Fujita et al also discloses the depressurized pressure is obtained in advance and is the pressure in which temperature variation during evacuation is within 0.5°C and vacuum electric discharge does not occur in the components in the closed vessel, this is a teaching that the depressurized pressure is a result effective variable (Abstract).

Art Unit: 1765

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Magome et al by using Fujita et al's method of alternating a filling and depressurizing step to obtain a desired concentration of gas in the closed vessel.

Referring to claim 2, the combination of Magome et al and Fujita et al does not teach a pressure within a range of 50 Pa to 10 kPa. The combination of Magome et al and Fujita et al does teach the depressurized pressure is a result effective variable that is obtained in advance. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Magome et al and Fujita et al by optimizing the pressure by conducting routine experimentation to obtain the a pressure within a range of 50 Pa to 10 kPa. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. (In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235(CCPA 1955)).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hasegawa et al (US 2003/0025889) teaches gases containing oxygen decrease the transmittance of an exposure light and nitrogen does not result in a decrease in transmittance ([0004]).

Matsumoto et al (US 5,430,303) teaches an exposure apparatus comprising impurity removing filter to improve the purity of gases (col 7-8).

Nishi (US 6,667,796) teaches supplying helium to a exposure system comprising an gas purity sensor (col 10) and removing oxygen from a supply gas in an ArF laser (col 19, ln 15-35).

Tanaka et al (US 2003/0020888) teaches an exposure apparatus comprising a gas supply device 150, a filter device 432 and a control device 402 (Fig 3 and [00138]).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew J Song
Examiner
Art Unit 1765

MJS

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

